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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/474,659	12/29/1999	TING K. YEE	3982-US	2531

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EXAMINER	
KIM, DAVID S	

ART UNIT	PAPER NUMBER
2633	

DATE MAILED: 10/09/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/474,659	YEE ET AL.	
	Examiner	Art Unit	
	David Kim	2633	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 December 1999* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☒ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-34* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-34* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 December 1999* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *4,5,7-9* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: "200" on page 5, line 1. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

2. Applicant is required to submit a proposed drawing correction in reply to this Office action. However, formal correction of the noted defect may be deferred until after the examiner has considered the proposed drawing correction. Failure to timely submit the proposed drawing correction will result in the abandonment of the application.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily

published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

4. **Claims 1-3, 6, 11, 13, 14, 21-23, 26, and 30** rejected under 35 U.S.C. 102(b) as being anticipated by Tsushima et al. (U.S. Patent No. 5,140,453).

Regarding claim 1, Tsushima et al. discloses:

An optical communications system (Fig. 1) for communicating an information signal comprising:

a receiver (Fig. 1) for recovering an information signal from an optical signal containing the information signal, the receiver comprising:

a heterodyne detector (combination of optical combiner 11 and heterodyne detector 13 in Fig. 1) for mixing an optical local oscillator (local oscillator 9 in Fig. 1) signal with an optical signal including at least one tone (center tone at carrier frequency f_S in Fig. 3A) and a first sideband (sidebands in Fig. 3A) of the information signal, to produce an electrical signal which is a frequency down-shifted version (Fig. 3C) of the optical signal; and

a signal extractor (demodulator 15 in Fig. 1) coupled to the heterodyne detector for mixing the first sideband of the electrical signal with one of the tones of the electrical signal to produce a first component (output signal 7 in Fig. 1) containing the information signal.

Regarding claim 2, Tsushima et al. discloses:

the optical communications system of claim 1 (see treatment of claim 1 above) wherein the heterodyne detector comprises:

an optical combiner (optical combiner 11 in Fig. 1) for combining the optical local oscillator signal and the optical signal; and

a square law detector (PIN photodiode 14 in Fig. 1, col. 5, lines 13-17; note that a PIN photodiode is a square law detector, page 8, line 24 in Applicant's specification) disposed to receive the combined optical local oscillator signal and optical signal.

Regarding claim 3, Tsushima et al. discloses:

The optical communications system of claim 2 (see treatment of claim 2 above) wherein the heterodyne detector further comprises:

a polarization controller coupled to the optical combiner (Figs. 6-7C) for matching a polarization of the optical local oscillator signal with a polarization of the optical signal (col. 8, lines 41-49, line 63 – col. 9, line 2, lines 32-36).

Regarding claim 6, Tsushima et al. discloses:

the optical communications system of claim 1 (see treatment of claim 1 above) wherein:

the optical signal further includes a second sideband (two sidebands in Fig. 3A) of the information signal; and the signal extractor comprises:

a first extraction path (upper path in Fig. 4) for mixing the first sideband of the electrical signal with one of the tones of the electrical signal to produce the first component;

a second extraction path (lower path in Fig. 4) for mixing the second sideband of the electrical signal with one of the tones of the electrical signal to produce a second component; and

a combiner (adder 19 in Fig. 4) for constructively combining the first and second components to produce a resultant component containing the information signal.

Regarding claim 11, Tsushima et al. discloses:

the optical communications system of claim 1 (see treatment of claim 1 above) wherein the tone includes a carrier (Fig. 3A, col. 6, lines 28-29) for the optical signal.

Regarding claim 13, Tsushima et al. discloses:

the optical communications system of claim 1 (see treatment of claim 1 above) wherein the first component includes a difference component (Fig. 3C, col. 6, lines 3-26).

Regarding claim 14, Tsushima et al. does not expressly disclose:

the optical communications system of claim 1 (see treatment of claim 1 above) further comprising:

a transmitter for generating the optical signal.

However, the reception of the optical signal inherently necessitates a transmission source for that optical signal. One of ordinary skill in the art would have recognized that such a transmission source is a transmitter.

Regarding claims 21-23, 26, and 30, claims 21, 22, 23, 26, and 30 are method claims that correspond to the system claims 1, 2, 3, 6, and 11, respectively. Therefore, the recited steps of claims 21-23, 26, and 30 read on the corresponding means described in system claims 1-3, 6, and 11.

5. **Claims 1, 2, 4, 14, 21, and 24** are rejected under 35 U.S.C. 102(b) as being anticipated by Cimini, Jr. et al. (U.S. Patent No. 5,008,958).

Regarding claim 1, Cimini, Jr. et al. discloses:

An optical communications system (Fig. 21) for communicating an information signal comprising:

a receiver (receiver in Fig. 21) for recovering an information signal from an optical signal containing the information signal, the receiver comprising:

a heterodyne detector (PIN photodiode in Fig. 21, col. 17, line 67 – col. 18, line 2) for mixing an optical local oscillator (local oscillator in Fig. 21) signal with an optical signal including at least one tone and a first sideband of the information signal, to produce an electrical signal which is a frequency down-shifted version of the optical signal; and

a signal extractor (FSK dual-filter receiver in Fig. 21, col. 18, lines 2-27) coupled to the heterodyne detector for mixing the first sideband of the electrical signal with one of the tones of the electrical signal to produce a first component containing the information signal.

Regarding claim 2, Cimini, Jr. et al. discloses:

the optical communications system of claim 1 (see treatment of claim 1 under Cimini, Jr. et al. above) wherein the heterodyne detector comprises:

an optical combiner (3 dB coupler, col. 17, line 67 – col. 18, line 1) for combining the optical local oscillator signal and the optical signal; and

a square law detector (PIN photodiode in Fig. 21, col. 18, lines 1-2; note that a PIN photodiode is a square law detector, page 8, line 24 in Applicant's specification) disposed to receive the combined optical local oscillator signal and optical signal.

Regarding claim 4, Cimini, Jr. et al. discloses:

The optical communications system of claim 1 (see treatment of claim 1 under Cimini, Jr. et al. above) wherein the signal extractor comprises:

a first frequency filter (IF filter in Fig. 21) for selecting the first sideband and one of the tones from the electrical signal;

a square law device (square-law detector in Fig. 21) coupled to the first frequency filter for squaring the frequency selected first sideband and tone to produce the first component; and

a second frequency filter (lowpass filter in Fig. 21) coupled to the square law device for selecting the first component.

Regarding claim 14, Cimini, Jr. et al. discloses:

the optical communications system of claim 1 (see treatment of claim 1 above under Cimini, Jr. et al.) further comprising:

a transmitter (transmitter in Fig. 21) for generating the optical signal.

Regarding claims 21 and 24, claims 21 and 24 are method claims that correspond to the system claims 1 and 4, respectively. Therefore, the recited steps of claims 21 and 24 read on the corresponding means described in system claims 1 and 4.

6. **Claim 16** is rejected under 35 U.S.C. 102(b) as being anticipated by Welford (U.S. Patent No. 4,893,352). Welford discloses:

A transmitter (Fig. 5) comprising:

a 1:3 splitting section (note three legs 16, 44, and 46 in Fig. 5) , for splitting a received optical carrier into three sub-signals;

a first and a second transmission leg (legs 44 and 46 in Fig. 5), each leg coupled to receive one of the three sub-signals from the 1:3 splitting section, for modulating

(modulation electronics in Fig. 5) the received optical carrier with a received information signal;

a third transmission leg (leg 16 in Fig. 5), coupled to receive one of the three sub-signals from the 1:3 splitting section, for producing an unmodulated version of the received optical carrier; and

a 3:1 combining section (power combiner 30 in Fig. 5) coupled to the first, second and third transmission legs, for combining the modulated optical carrier with the unmodulated optical carrier.

7. **Claims 16 and 17** are rejected under 35 U.S.C. 102(e) as being anticipated by Coward et al. (U.S. Patent No. 6,204,951 B1).

Regarding claim 16, Coward et al. discloses:

A transmitter (Fig. 11) comprising:

a 1:3 splitting section (note three legs 104A-C in Fig. 11) , for splitting a received optical carrier into three sub-signals;

a first and a second transmission leg (legs 104A and 104B in Fig. 11), each leg coupled to receive one of the three sub-signals from the 1:3 splitting section, for modulating (col. 14, lines 1-19; col. 5, lines 1-6) the received optical carrier with a received information signal;

a third transmission leg (leg 104C in Fig. 11), coupled to receive one of the three sub-signals from the 1:3 splitting section, for producing an unmodulated version of the received optical carrier; and

a 3:1 combining section (combining section 106 in Fig. 11) coupled to the first, second and third transmission legs, for combining the modulated optical carrier with the unmodulated optical carrier.

Regarding claim 17, Coward et al. discloses:

The transmitter of claim 16 (see treatment of claim 16 under Coward et al. above) wherein the third transmission leg includes a control section (adjustable coupler 1102 in Fig. 11; col. 14, lines 4-6, 14-19) for controlling an amplitude of the unmodulated optical carrier.

8. **Claims 16 and 18** are rejected under 35 U.S.C. 102(b) as being anticipated by Gertel et al. (U.S. Patent No. 5,532,857).

Regarding claim 16, Gertel et al. discloses:

A transmitter (Fig. 5) comprising:

a third transmission leg (lower path with phase shifter 16 in Fig. 1), coupled to receive one of the three sub-signals from the 1:3 splitting section, for producing an unmodulated version of the received optical carrier; and

Gertel et al. does not expressly disclose:

a 1:3 splitting section, for splitting a received optical carrier into three sub-signals;

a first and a second transmission leg, each leg coupled to receive one of the three sub-signals from the 1:3 splitting section, for modulating the received optical carrier with a received information signal;

a 3:1 combining section coupled to the first, second and third transmission legs, for combining the modulated optical carrier with the unmodulated optical carrier.

However, Gertel et al. discloses a Mach-Zehnder modulator 14 in Fig. 1. These devices are extremely well known in the art. Mach-Zehnder modulators inherently split one input into two internal paths. Therefore, Gertel et al. inherently discloses a 1:3 splitting section (splitter 12 and splitter inside Mach-Zehnder modulator 14 in Fig. 1), a first and second transmission leg (for modulation by information signal input at 18 in Fig. 1), and a 3:1 combining section (combiner 20 in Fig. 1).

Regarding claim 18, Gertel et al. discloses:

the transmitter of claim 16 (see treatment of claim 16 under Gertel et al. above) wherein the third transmission leg includes a control section (phase shifter 16 in Fig. 1) for controlling a phase of the unmodulated optical carrier.

9. **Claim 19** is rejected under 35 U.S.C. 102(b) as being anticipated by Hill et al. (U.S. Patent No. 5,546,190). Hill et al. discloses:

A transmitter (Fig. 2) comprising:

a combiner (Fig. 2, col. 4, lines 12-27) for combining a received pilot tone with a received information signal to produce an intermediate signal; and

an optical modulator (optical phase modulator 240 in Fig. 2) for modulating a received optical carrier with the intermediate signal.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11. **Claims 5, 9, 25, and 28** are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsushima et al. in view of Calvani et al. (U.S. Patent No. 4,817,206).

Regarding claim 5, Tsushima et al. discloses all the limitations of claim 5 (see treatment of claim 1 under Tsushima et al. above) except for the first, second, third frequency filters, and the multiplier. Calvani et al. does the third filter and multiplier (Calvani et al., low-pass filter 20 and mixer 19 in Fig. 1). Calvani et al. does not expressly disclose the first and second filters as frequency filters per se, but the combination of the splitter 14, detector 16, and amplifier 18 and the combination of the splitter 14, detector 15, and amplifier 17 provide the same functional purposes. That is, one combination selects the first sideband (Calvani et al., col. 4, lines 40-43) while the other combination selects a tone (Calvani et al., col. 4, lines 44-45). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to use the teachings of Calvani et al. in the system of Tsushima et al. One of ordinary skill in the art would have been motivated to do this to cancel phase noise (Calvani et al., col. 2, lines 55-62).

Regarding claim 9, Tsushima et al. in view of Calvani et al. discloses all the limitations of claim 9 (see treatments of claims 5 and 6 above). In particular, note the first (Calvani et al., items 14a-21a in Fig. 1) and second extraction paths (Calvani et al., items 14-21 in Fig. 1).

Regarding claims 25 and 28, claims 25 and 28 are method claims that correspond to the system claims 5 and 9, respectively. Therefore, the recited steps of claims 25 and 28 read on the corresponding means described in system claims 5 and 9.

Claims 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tsushima et al. in view of Meissner (U.S. Patent No. 5,081,712). Tsushima et al. discloses all the limitations of claim 7 except that the first extraction path overlaps the second extraction path. However, Meissner teaches such an overlapping of two extraction paths (Meissner, Fig. 1). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to use the teaching of Meissner in the system of Tsushima et al. One of ordinary skill in the art would have been motivated to do this since Meissner's teaching can "provide a simple method and apparatus for obtaining phase insensitive and/or polarization-insensitive optical heterodyne reception" (Meissner, col. 1, lines 60-63).

12. **Claims 8 and 27** are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsushima et al. in view of Shibutani (U.S. Patent No. 4,972,515).

Regarding claim 8, Tsushima et al. discloses all the limitations of claim 8 (see treatment of claim 6 above) except for the details of each extraction path. However, Shibutani discloses such extraction paths (Shibutani, demodulator circuits 31 and 32 in Fig. 1). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to use the extraction paths of Shibutani in the system of Tsushima et al. One of ordinary skill in the art would have been motivated to do this since the paths have excellent reception sensitivity (Shibutani, col. 3, lines 35-37).

Regarding claim 27, claim 27 is a method claim that corresponds to the system claim 8. Therefore, the recited steps of claims 27 read on the corresponding means described in system claim 8.

13. **Claims 10 and 29** are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsushima et al. in view of Wetherell (U.S. Patent No. 4,723,315). Tsushima et al. discloses all the limitations of claim 10 (see treatment of claim 6 above) except for the phase shifter. Wetherell does disclose such a phase shifter (Wetherell, amplitude and phase sensor 50 and delay line DL_1 in Fig. 10). At the time the invention was made, one of ordinary skill in the art would have incorporated this phase shifter teaching of Wetherell in the system of Tsushima et al. One of ordinary skill in the art would have been motivated to do this since such a phase shifter reduces the sensitivity of the detector to changes in the polarization of the light signal. This sensitivity can lead to performance degradation (Wetherell, col. 5, lines 17-34).

Regarding claim 29, claim 29 is a method claim that corresponds to the system claim 10. Therefore, the recited steps of claims 29 read on the corresponding means described in system claim 10.

14. **Claims 12 and 33** are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsushima et al. in view of Hill et al.

Regarding claim 12, Tsushima et al. discloses all the limitations of claim 12 (see treatment of claim 1 under Tsushima et al. above) except that the tone includes a pilot tone located at a frequency separated from a carrier frequency for the optical signal. Hill et al. does disclose such a pilot tone (Figs. 2-5; col. 2, line 62 – col. 3, line 33; col. 4, lines 12-53; col. 5, lines 21-28; col. 5, line 59 – col. 6, line 11). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to use the pilot tone of Hill et al. in the system of Tsushima et al. One of ordinary skill in the art would have been motivated to do this to add the following features:

simultaneously generate subcarrier frequencies for demodulation, the clock signal, and an automatic frequency control signal for the local oscillator (Hill et al., col. 3, lines 28-32).

Regarding claim 33, claim 33 is a method claim that corresponds to the system claim 12. Therefore, the recited steps of claims 33 read on the corresponding means described in system claim 12.

15. **Claim 15** is rejected under 35 U.S.C. 103(a) as being unpatentable over Tsushima et al. in view of Welford. Tsushima et al. discloses all the limitations of claim 15 (see treatment of claim 14 under Tsushima et al. above) except for the limitations regarding the transmitter. Welford discloses all the limitations of such a transmitter (see treatment of claim 16 under Welford above). At the time in the invention was made, it would have been obvious to a person of ordinary skill in the art to use the transmitter of Welford in the system of Tsushima et al. One of ordinary skill in the art would have been motivated to do this since "the device is suitable for use in a three frequency heterodyne system" (Welford, col. 1, lines 64-65). "In the three frequency heterodyne system [of Welford], a reference signal is transmitted with the modulated data carrying signal...[T]he third frequency f_{LO} of a local oscillator is introduced at the receiver" (Welford, col. 1, lines 25-27, 35-36). One of ordinary skill in the art would have realized that transmitter teachings of Welford are compatible with the receiver teachings of Tsushima et al.

16. **Claim 20** is rejected under 35 U.S.C. 103(a) as being unpatentable over Hill et al. in view of Olshansky (U.S. Patent No. 5,301,058). Hill et al. discloses all the limitations (see treatment of claim 19 above) except that the optical modulator includes

a Mach-Zehnder modulator. Mach-Zehnder modulators are extremely well known in the art. One of ordinary skill in the art would have been well aware of this modulator choice and the accompanying benefits of its design simplicity, convenience of usage, and ready availability of research documentation. Additionally, Olshansky discloses such a modulator (Olshansky, Figs. 5 and 6, col. 6, lines 51-61). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to use the modulator of Olshansky as the modulator of Hill et al. One of ordinary skill in the art would have been motivated to do this since the modulator of Olshansky cancels second order intermodulation products (Olshansky, col. 6, lines 53-54). These products can cause interference between adjacent optical channels (Olshansky, col. 2, lines 12-24).

17. **Claims 31 and 32** are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsushima et al. in view of Welford, further in view of Atlas et al. (U.S. Patent No. 5,963,352).

Regarding claim 31, Tsushima et al. in view of Welford (as combined to treat claim 15 above) discloses all the limitations of claim 31 (see treatment of claim 30 under Tsushima et al. above) except for modulating an optical carrier with the information signal using a raised cosine modulation biased at a V_π point. Atlas et al. does disclose such a step (Atlas et al., col. 5, lines 47-54). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to use the step of Atlas et al. in the system of Tsushima et al. in view of Welford. One of ordinary skill in the art would have been motivated to do this since the teachings of Atlas et al. enable one to cancel harmonic distortion components (Atlas et al., col. 5, lines 55-63).

Regarding claim 32, Tsushima et al. in view of Welford, further in view of Atlas et al. discloses the method of claim 30 (see treatment of claim 30 under Tsushima et al. above) further comprising modulating an optical modulating an optical carrier with the information signal using a raised cosine modulation biased at a point slightly offset from a V_π point to produce the optical signal (Atlas et al., col. 5, lines 47-54).

18. **Claim 34** is rejected under 35 U.S.C. 103(a) as being unpatentable over Tsushima et al. in view of Hill et al. as applied to claim 33 above, and further in view of Atlas et al. Tsushima et al. in view of Hill et al. discloses all the limitations of claim 34 (see treatment of claim 33 above) except for the step of modulating an optical carrier with the combined information signal and pilot tone using a raised cosine modulation biased at a V_π point. Atlas et al. does disclose such a step (Atlas et al., col. 5, lines 47-54). At the time the invention was made, it would have been obvious to a person of ordinary skill in the art to use the step of Atlas et al. in the system of Tsushima et al. in view of Hill et al. One of ordinary skill in the art would have been motivated to do this since the teachings of Atlas et al. enable one to cancel harmonic distortion components (Atlas et al., col. 5, lines 55-63).

Double Patenting

19. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double

patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

20. **Claims 16-18** are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1 and 8 of U.S. Patent No. 6,204,951 B1. Although the conflicting claims are not identical, they are not patentably distinct from each other because the Applicant's claims are broader than the patent claims. See *In re Van Ornum and Stang*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982) and *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993). The broad claims in Applicant's claims 16-18 are rejected as obviousness double patenting over previously patented narrow claims.

Regarding claim 16 of the application, consider claim 1 of the patent. The Applicant's claim 16 discloses the same limitations of claim 1 of the patent except for the phase-shifting limitations in claim 1 of the patent. Therefore, the Applicant's claim 16 is broader than claim 1 of the patent.

Regarding claim 17 of the application, consider claim 8 of the patent. The adjustable splitting ratio of the patent claim anticipates the control section of Applicant's claim 17.

Regarding claim 18 of the application, consider claim 1 of the patent. The system of the patent claim anticipates the transmitter of the Applicant's claim 18.

Conclusion

21. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Yao, Fuse, and Dodds are cited to show related transmitters.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Kim whose telephone number is 703-305-6457. The examiner can normally be reached on Mon.-Fri. 9 AM to 5 PM (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on 703-305-4729. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9314 for regular communications and 703-872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-4750.

DSK
October 3, 2002

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